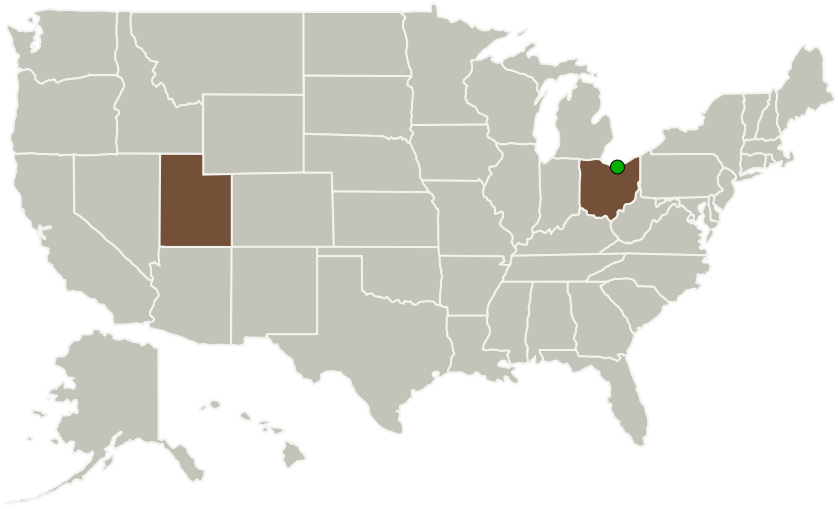
Advanced Li/S Batteries Based on Novel Composite Cathode and Electrolyte System, Phase I

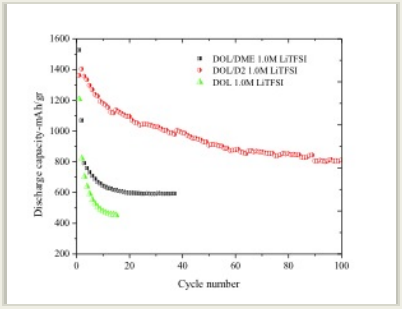
Completed Technology Project (2013 - 2013)

Project Introduction

Energy storage devices in many aerospace applications are facing unique challenges. Most of such applications, including remote surveillance, satellites, reusable launch vehicles, etc. depend on high-performance, highly specialized batteries. NASA desires high specific energy batteries that are safe for human exploration missions. Since none exist today, they must be developed. Storagenergy Technologies Inc. and its team members propose to develop a novel core-shell structured sulfur-carbon nanocomposite and novel electrolyte systems for high performance rechargeable lithium-sulfur batteries. In Phase I, the composite materials will be synthesized and characterized. The composite's electrochemical performance along with novel electrolyte systems will be evaluated in full cells. Cells with with a minimum capacity of at least 200 mAh will be fabricated and evaluated. During the Phase II, the composite's composition will be optimized further, its performance in cells with 1Ah will be evaluated, and a low-cost large-scale material production process will be developed.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Storagenergy Technologies, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	Salt Lake City, Utah
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Ohio	Utah

Project Transitions

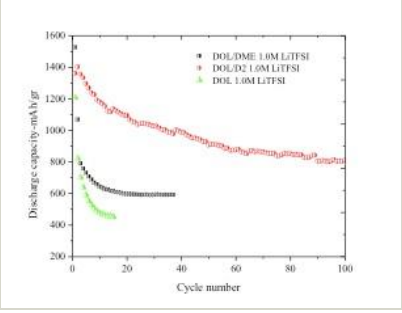
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140417)*

Images



Project Image
Advanced Li/S Batteries Based on Novel Composite Cathode and Electrolyte System
(https://techport.nasa.gov/image/126035)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Storagenergy Technologies, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Feng Zhao

Co-Investigator:
Feng Zhao

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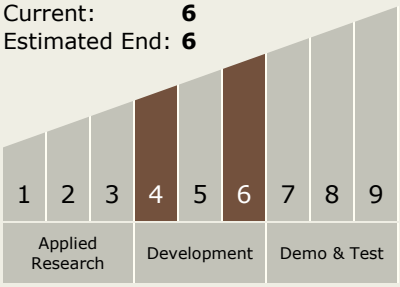
Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.1 Electrochemical: Batteries

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System